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AUTHOR Shetty, Yolan L.
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ABSTRACT

The recent influx of computer programs to aid students in writing has created some confusion between the linear, directed process of problem-solving and the less directed, more chaotic process of putting words down on paper. Though problem-solving and writing-as-process have some points in common, they cannot be taken as equivalent, because problem-solving as represented by the writing programs lacks the imprecise, ambiguous, playful process of composing that can be called "metaphoring." Metaphoring, an unstructured way of comparing words or ideas, underlies all kinds of thought and writing, and to teach writing as linear, structured process is to leave out the "tinkering" and "play" that characterizes most types of composition. In this sense, writing as problem-solving seems incompatible with writing as coming-to-know, and the struggle to compose implicit in the latter. Educators who teach composition with computers must embrace the responsibility of knowing that keyboarding is not composing, that one kind of program is suitable for machine work and another is not, and that we shape as much as possible the effect computers have on the way we think. (JC)

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Writing-as-Process and Problem-Solving: A View Toward Theory

Yolan L. Shetty

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Writing-as-Process and Problem-Solving: A View Toward Theory

Since Newell and Simon's pioneering AI research, the brain/computer analogy has become a powerful emblem for modern information theorists, and it has given rise to an even more powerful model for the way information-processing occurs. That model--problem-solving--is the paradigm for both human thinking and machine processing.

In the area of composition instruction, it is perhaps Linda Flower who speaks most directly and forcibly for the problem-solving approach to writing. Her recent book, Problem-Solving Strategies for Writing, is a modern-day rhetoric which offers writers "a set of principles and strategies for planning discourse, for generating and organizing ideas, and for designing and editing their prose for a reader" (vi). The book defines distinctive parts of the writing process and creates a step-by-step system easy for the student to follow. Though the system is meant, admirably, to give the writer power to make choices, and though Flower does caution the student that these steps are not linear ("Writers constantly return to earlier steps such as planning in order to carry out later ones" [50]), both the warning and the good will toward student-empowerment are bruised by the book's format. What appears in the book appears as prescription, and the prescription is based on the recognition and acceptance of breakdown or failure: Step number one, find a problem; Step number two, solve it.

1

Because it might be said that WANDAH (Writing-aid and Author's Helper)--marketed as HBJ Writer--is the software descendant of Hayes and Flower's cognition and composition theories, and because it is state-of-the-art word processing and invention system par exellence, produced specifically for freshman composition courses and designed from the philosophical viewpoint that composing is equivalent to problem-solving with words, it is a computer program that ought to at least be introduced here. This program more than any other provides for the theoretical and pedagogical issues at hand, as well as focuses the multiple kinds and qualities of "writing domain" programs.

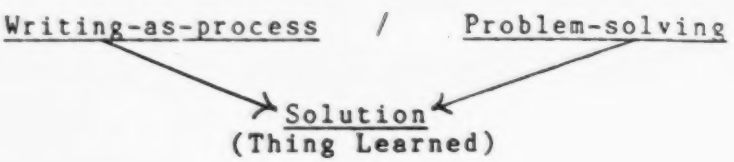
Though WANDAH gestures toward more flexibility on the part of the student by encouraging continual self-monitoring for planning and revising while text is being generated, it nonetheless does demand conformity to a particular shape imagined by the software creator. (To be fair, all computer programs, by their nature as "programme," do.)

What is important, is the idea that writing constitutes a kind of bland problem-solving--A viewpoint, I think, that undermines our most contemporary view of composition. Certainly, writing-as-process can be viewed--as it is by our most forward thinkers--as a means of learning, and one that is across-the-board, age or level-wise, and interdisciplinary (Fforum 220-286). To recognize the power of writing in this way is to acknowledge writing as a non domain-specific

activity. It is to present computer program developers with a distinct problem. Unlike mathematics and science, which are subject-areas of study and which Pittsburgh's Lesgold and Reif (1983) spoke of in combination with writing as "problem-solving activities", writing-as-process cannot be defined by its parts (though rhetoric can). To do so is to contradict the very nature of the writing-as-process label conferred by theorists and teachers: It is to relegate writing once again to product, to pre- and pro-scription, to a table of contents that can be perused, practiced, and mastered. But "writing-as-process" charges us teachers with peculiar responsibility: We cannot avoid paying attention to the matter that really matters educationally, to the <u>doing</u> of composing. We can't help recognizing that the making of meaning is the way out of chaos (Berthoff); and the way out of chaos, verbal or otherwise, is by no means straight, narrow, nor even recursively linear. It is, on the contrary, meandering, extemporaneous, contingent; and it is this excursion, this excursive motion of thought, that is the process of learning.

It might be argued philosophically, that since both problem-solving and writing-as-process are: (1) processes (active rather than static), (2) domain free (able to traverse any subject area), (3) methods of doing things--that is they have their own operational procedures, and (4) ways of learning, they should be viewed as cognitive equals. Considering their commonalities, writing-as-process and

problem-solving would appear, graphically, on the same plane:



Yet something nags. If problem-solving can be used effectively during the process of composing and if writing can be used successfully in the process of problem-solving, by what mechanism is one permitted to subordinate the other? In figure 1, "Solution" and "Thing Learned" (in the abstract) might in some ways be equivalent to one another, but where then is the text, the actual product of writing that is also in some ways equivalent to a problem solution (i.e., the sum of two numbers)? When I think about how I think, I know that the relationship of problem-solving and writing-as-process as represented in figure 1 is simply too simple: A factor is missing. Though sensed only vaguely at first, I know there is a different kind of thinking that I do which is elemental, and which is a component, of figure 1, that reduces writing-as-process to an even more basic level.

Since Newell and Simon's brain/computer analogy, we have rather accepted machine information-processing/problem-solving experiments as true simulations of human thought processes. Few seem bothered by the notion of brain as logic machine. I am. Assuming that problem-solving is the equivalent of thinking is to my mind to err. No doubt, problem-solving is a component of thinking, but not--and in

particular in terms of the thinking represented by writing--is it the only nor necessarily the most important one. What the nature is of this other facet of human thought, and how it manifests itself in language, is of utmost importance to composition pedagogy. It is the place where we can imagine another way that thought proceeds during the course of composing. By modifying our original model (figure 1), a clearer representation of the relationship between writing and problem-solving can be obtained:

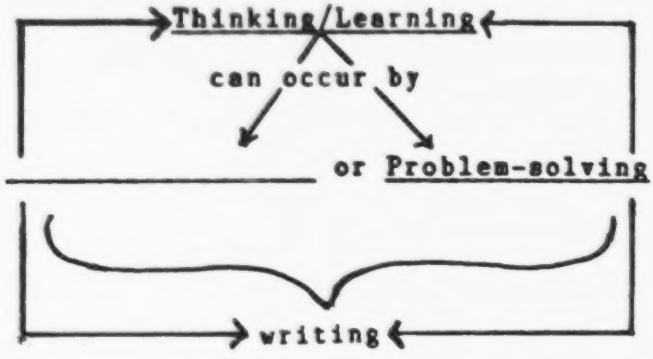


figure 2

We can recognize a sort of problem-solving alter ego--and we can recognize that it, along with problem-solving, zig-zags through the writing process. It is what I call metaphoring.

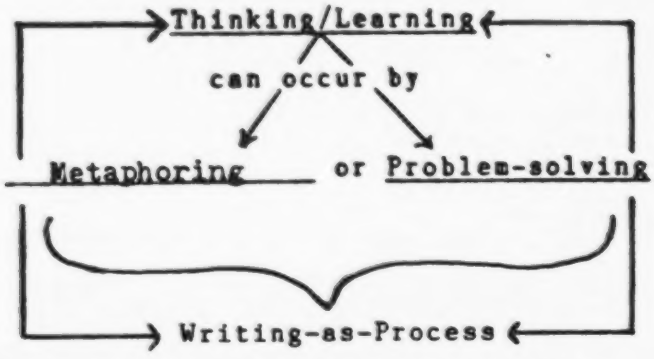


figure 3

Defining the relationship between cognitive theory and metaphor and between metaphor and the writing process is not easy; but by laying aside the traditional and conservative

view that metaphor is figurative and augmentative (i.e., the language of poets) and choosing to recognize it as constitutive (i.e., inseparable from any form of discourse), which is a view being argued more and more today, a place can be found to begin. I don't mean to say that metaphor is not figurative, not a "thing" that may be defined by its form and its "ornamentality"--It can be--but that is a definition more limited than modern critical theory permits. It is also less germane to the topic of cognitive theory than is the broader definition I want to defend. To affirm metaphor as constitutive is to recognize it as a part of the cognitive processes of all humankind at all times. It is to understand that metaphoring is a way of thinking that is no less powerful than problem-solving, and may, in fact, deserve the better part of attention when it comes to producing a thoughtful piece of text. When it comes to the doing, the act of composing, of making meaning, metaphoring is absolutely basic. It is the thing that distinguishes the the organic from the mechanical.

From the viewpoint of many theorists, whether linguists, literary critics, cultural anthropologists, or simply thinkers who think about thinking, perceiving IS metaphoring. However subconsciously, metaphor is recognized as representative of cognitive activity. We part company here with those philosophers--including Descartes, Dilthey, Heidegger, Unamuno--who believe we think in words and who believe our

ontology is determined by that fact. (For my part, I believe that when we think in words, we problem-solve and that our goal is product-oriented; and when we think in metaphor, we ideate, whose goal is process-oriented.)

In The Philosophy of Rhetoric, I.A. Richards declares that "the whole business of Rhetoric comes down to comparisons between the meanings of words" (37) and spends a good deal of time extolling metaphor as "the omnipresent principle of language" (92). Most importantly, he asserts that metaphor is fundamentally a "borrowing between and intercourse of thoughts, a transaction between contexts. Thought is metaphoric, and proceeds by comparison, and the metaphors of language derive thereform" (emphasis Richards', 94).

Metaphor is essential. It is both primal and primary. It "governs both the growth of language and our acquisition of it" (W.V. Quine, "A Postscript on Metaphor"). In Northrop Frye's The Educated Imagination, where he takes language back to its imaginative beginnings, on his primitive island metaphor does precede the word, and putting perception into words (i.e., labeling, naming, writing ideas down) is the process of attempting to make meaning effable. And as Ernest Fenollosa points out, "Metaphor, [poetry's] chief device, is at once the substance of nature and of language. Poetry only does consciously what the primitive races did unconsciously" (On Metaphor 27). Perhaps poetry only does more abstractly what all people do when they talk, think, or write whether it

be sermon, essay, lecture, novel, freshman composition, or gossip. Metaphoring is the human way of coming to know, and it is essential: "Metaphors are not merely things to be seen beyond. In fact, one can see beyond them only by using other metaphors. It is as though the ability to comprehend experience through metaphor were a sense, like seeing or touching or hearing, with metaphors providing the only ways to perceive and experience much of the world. Metaphor is as much a part of our functioning as our sense of touch, and as precious" (Lakoff & Johnson 239).

If we think, perceive, and ideate by analogy (which is system but not systematic) from our earliest encounters in babyhood memory to theories of propositional calculus, then humanity collides in a very real way when we begin to talk about "intelligent" machines or intelligent computer programs that are meant to guide our way in a given domain. Human thought processes are by no means linear or simply binary, nor are they reducible to the precise kind of language required by computer programs. Metaphor itself (it is easiest here to think of the kind that is a thing and can be looked at on paper, pushed around, "dissected") is imprecise; it derives its considerable power in fact from its ambiguity, from that space in the middle that defies naming.

When writing is taught as problem-solving (as in WANDAH, whose pedagogical assumption is that composing is equivalent to problem-solving with words), what is being learned is

method, something quite different I think from composing. What occurs when a writing program's main value appears to be in the teaching of heuristics, or step-by-step strategies for getting something on paper, is an implicit lesson to the user about what it means to write. For today's composition teachers, who do affirm the process of writing and who do teach it as a personal and individual means of making meaning, it is a lesson they would or should not want taught. It is one the composition student cannot afford.

As David Bartholomae notes, "An individual act of writing represents the dialectic between the desire to be conventional and the desire to be idiosyncratic, between the individual and the culture"(7); certainly between personal style and prescription. Overloading writing pedagogy with problem-solving techniques, in outlining, organizing, prewriting, and style checking for example, deprives the student writer of flexibility and "play". The most important mental activity, which is the process of ideating, is suppressed while the student thinks and responds (to the program) in words. Computer Writing becomes, then, a rhetorical "efficiency"--like the themewriting of yore, which modern pedagogical theory has barely had time to defend against. The pedagogies which accentuate "the discursive character of language, its tendency to 'run along'" (Berthoff 70) or the abstracting process whereby a writer becomes aware of "how he and others create information and ideas" (Moffett

25), or which emphasize the making of metaphor as "the occasion and the means of that growth which is the mind's endless endeavour to order itself" (Richards 131), are pedagogies that are subverted by the wholesale acceptance of the problem-solving approach to writing. The process itself (of poblem-solving) does not permit of the imaging and feeling that occur during cognition (Paul Ricoeur "The Metaphorical Process as Cognition, Imagination, and Feeling" in On Metaphor 141-157), as well as denies what might be called the "stride by intuition" that occurs in attempting verbal composition. The student who "knows what he wants to say but just can't find the right words" exemplifies that motion of mind, that excursion of thought, when it has become struggle: It is hard and arduous work to translate metaphoring into words-on-paper; It is difficult, and sometimes awkward, to render thought into meaning. Not unlike the best of us perhaps, the freshman writer finds following a structured program--of well-ordered and concrete steps--far preferable to the white chaos of a blank sheet of paper.

Nonetheless, the composition teacher who recognizes more realistically the relationship between logos and cognitio and who respects the college freshman's right to explore and to "rescue education from the package", as it were, will discover a very clear incompatibility between her pedagogy and the computer writing and rhetoric programs available

today. If she has come to expect that composing stands for thinking--on paper, and for the actual experience of coming to know, writing taught as problem-solving will have small place in her classroom; for when problem-solving is the major informant of a course, the having of something to say and the attention to its saying are relegated to back-seat status. When convention overpowers idiosyncracy, it is a loss to both the reader and writer. Is not the most desirable text to read the one that at least gestures toward the idiosyncratic?

Contemporary composition theorists who impress with notions of tinkering, playing, and inventing and who recognize the sense of fun implied by those labels are obliged to find strict dependence on problem-solving anathema to the goals set for their courses. Problem-solving's strategies work against the kind of abstraction that's necessary to a thinker-writer's development, as well as against the "natural" process that occurs during the stream of composing. Since nearly all computer programs being developed today depend on problem-solving strategies, writing theorist/educators need to be particularly cautious when looking at invention programs. Our modern embrace of the computer revolution fetches equally modern responsibilities: To know that keyboarding is not composing; to understand that one kind of program is suitable for machine work and another is not; and most importantly to see that we shape, as much as we're able, the considerable effect computers have on the very way we think.

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